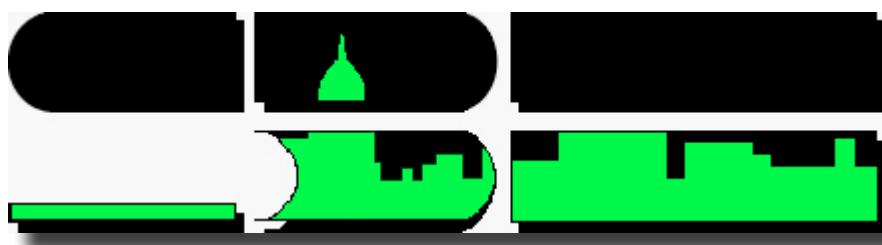


SBE Membership Drive through May 31



March 2017

**Society of
Broadcast Engineers
Chapter 24
Newsletter
Madison, Wisconsin**



Next Meeting

& LAST CALL FOR NOMINATIONS

Thursday, March 23

VIRTUAL RADIO BROADCASTING

Bill Bennett, Radio applications
Engineer for LAWO, INC.,



will give us a presentation on how radio is migrating for a hardware based operation to a software-based facility.

IT's influence on radio broadcasters is strong, and awareness of hardware virtualization and the "glass cockpit" is growing fast.

In the presentation, we'll look at what you can do today, and where things may go in the future, exploring ways broadcasters can reap operational and monetary gains for IT's R&D investment.

Panera Sandwiches, Salads & Soda provided by LAWO 6:00 PM
WISC Conference Room B
7025 Raymond Road
Madison, WI

Meeting and Program at 7:00PM
WISC Conference Room B
7025 Raymond Road
Madison, WI

Park in front parking lot;
enter via front lobby entrance.

Visitors & Guests are welcome
to join us!

Auction Coming to an End

>>> by Tom Smith

The Incentive Auction is nearing the end, as both the stage four reverse and forward auctions have come to the end. The reverse auction ended on January 13, with the remaining broadcasters receiving a total of \$10,054,676,822. The forward auction, in which the wireless broadband companies bid on the spectrum the broadcasters were giving, started on January 18 and ended on February 10 with a total of \$19,632,506,746. After deducting the \$10,054,676,822 the broadcasters will receive for going off the air, sharing a channel or moving to VHF, the \$1.75 billion that will be paid to broadcasters who have to move to a new channel and the cost of conducting the auction, which will be about \$200 million, will leave \$7,627,829,924 to go to the U.S. Treasury

>>> **Auction** continued on page 5

We Need You

Chapter 24 has a ballot position open for Treasurer. This is a great opportunity for you. If you have never served as an officer in our chapter please consider it now. It's a great way to develop leadership skills that will carry you through the rest of your career and a great way to give back to the profession. Also consider other volunteer positions, like Newsletter Editor or Program Committee.

An officer position is open to any Chapter 24 member in good standing. Please contact Steve Paugh <sipaugh@sbe.org>, our Nominations Chair.



Coming Up

- | | |
|-----------------|---------------------------------------|
| Tues., Apr. 18 | "Share your Favorite App" Night |
| Wed., May 24 | NAB Wrap-up |
| Thurs., June 22 | SBE Summer Family Night — need ideas! |

RF TRANSMITTER MEASUREMENTS: Your Help Requested

In cooperation with the SBE, I am presenting an introductory level, eight part series of webinars entitled *RF101: Broadcast Terrestrial Transmission Systems*. The seventh module in the series is on *RF Transmitter Measurements*. In preparation for this webinar slated for August of 2017, I am asking my fellow broadcasters for help in creating short video clips, photos, and checklists.

The areas of specific needs are as follows: power measurements, power calibration, mask measurements, eye diagrams, frequency measurements, etc. as appropriate for DTV, FM & AM.

I would like to visit your facility, watch you do your tests, photograph, video, and take notes during the process. I can give you recognition for your assistance, or if you prefer, you and your station may remain completely anonymous. I would like to complete these technical reviews by the first of June.

I know that throughout the years, you may have developed special hints, tips, and checklists to help easily verify compliance. Why not share these ideas with others? Also, potentially this could be a good way to gain some SBE recertification points as you demonstrate your area of expertise.

For more details, or to express your initial interest, e-mail me at dbaldridge@sbe.org.

Dennis Baldridge



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Chapter Contacts

Chair

Kevin Ruppert, CPBE, CBNT
WISC-TV
W: 608-271-4321
kruppert@wisctv.com

Vice-Chair

Richard Wood
Resonant Results
W: 608-839-3950
rwoodsky@frontier.net

Secretary

Mike Norton, CSTE, CBNE
ECB
W: 608-264-9807
mnorton@ecb.org

Treasurer & Webmaster

Leonard Charles, CPBE
WISC-TV
W: 608-271-4321
lcharles@wisctv.com

Committee Appointees

Program Committee

Steve Paugh, CPBE
608-277-5139
spaugh@sbe.org
Volunteer for the program committee!

Membership / Newsletter Editor

Paul Stoffel, CPBE
608-358-5351
pgstoffel@gmail.com

Sustaining Membership

Fred Sperry, CPBE
608-264-9806
fred.sperry@ecb.org

Certification & Education

Jim Hermanson, CPBE, CBNT
services@jimhermanson.com

Frequency Coordination

Tom Smith, CPBE
608-837-2729
smithtc100@hotmail.com



Meeting Minutes

from the February 2017 Business Meeting

The Society of Broadcast Engineers Chapter 24 monthly meeting was held on Wednesday, February 22, 2017 at the Wisconsin Public Broadcasting Center in Madison. There were 16 members present, 12 who held SBE certification.

The meeting was called to order at 7:04pm by chapter Chair Kevin Ruppert. The secretary's report of the January meeting minutes was then approved as published in the February Newsletter.

Treasurer Leonard Charles noted the Chapter was credited \$60 in service fees which had been charged after the account type was changed last year. Unfortunately another service fee has been charged, and work continues to get this resolved. There was no other activity, and the account balance remains on a positive footing.

Program Committee chair Steve Paugh announced the March program will be by Lawo on Virtual Radio Broadcasting, along with the final call for officer nominations. The April meeting will include a program on "I didn't know there was an App for that..." reviewing helpful software tools. Elections will be held in April, via the online voting system at the sbe24.org website.

With a Certification and Education update, Jim Hermanson mentioned that two local certification exams were taken recently. He said the next exam opportunity was on April 25 at the NAB convention in Las Vegas, with an application deadline of March 17. The following local exam window of June 2– 12 has an application deadline of April 21.

As Frequency Coordinator, Tom Smith said the last coordination request was for a 2 GHz frequency used at a Badger game to accommodate a hat-mounted referee camera. He also said there were no frequency requests made for the past election.

For the SBE National report, Leonard Charles stated the next Webinar titled RF 101, Module 2, Transmission Lines, is scheduled for Thursday March 2. It will be presented by Chapter 24 member Dennis Baldridge. More details are available at www.sbe.org. The annual SBE Membership Recruitment Drive runs the entire month of March. If you recruit one new member, you will be eligible to win a trip to the SBE National Meeting in October at the Rocky Mountain Audio Video Expo show in Denver.

In old business, Steve Paugh reviewed the nomination process and announced the current candidates: Rich Wood running for chair, and Mike Norton for secretary. Volunteers are needed to run for vice chair and treasurer. Clif Groth then threw his hat in the ring for vice chair.

In general announcements, a question was raised about Chapter 24 reimbursing members who attend SBE educational webinars. A subcommittee is being formed to work through the details of how this process would work, with an update expected at a future meeting.

The meeting was adjourned at 7:16pm. Steve Paugh turned the floor over to Phil Mikalofsky, who gave a detailed presentation on an open-source CCTV system using a Raspberry Pi single board computer. He showed a live system operating at a transmitter site, followed by loading and configuring a system from scratch.

Submitted by Mike Norton, Secretary


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Amateur Radio News

compiled by Tom Weeden, WJ9H

- The just-concluded run of ionospheric investigations conducted from Alaska's High Frequency Active Auroral Research Program (HAARP) observatory — quite likely the most powerful HF transmission facility in the world — revived the latent shortwave listener (SWL) lurking within most radio amateurs. Operating under Part 5 Experimental license WI2XFX, HAARP last month even aired some classical music as it conducted its first scientific research campaign since being taken over 18 months ago from the military by the University of Alaska Fairbanks (UAF) Geophysical Institute.



A section of the extensive HAARP antenna array and one of the transmitter shelters.
(Photo by Jeff Dumps, KL4IU)

UAF Space Physics Group Assistant Research Professor Chris Fallen, KL3WX, focused on two experiments — one called "airglow" that literally aimed to light up the ionosphere, and another to demonstrate the so-called "Luxembourg effect," first noticed on a 1930s Radio Luxembourg broadcast. Public engagement was part of his plan, and Fallen this week said the Twitter and e-mail feedback from his transmissions had been "fantastic," and that his science campaign had become "quite an event."

"Thank you for making a difference and advancing Amateur Radio as well," Doug Howard, VE6CID, tweeted. Another Twitter follower enthused, "You're running the coolest DX station in the world."

Fallen started and stopped each experiment block with DTMF tones,

transmitted in AM on or about 2.8 and 3.3 MHz, each channel fed with audio tones of different frequencies or, in the case of music, as a separate stereo channel. If the Luxembourg effect is present, skywave-signal listeners would hear both channels combined on a single frequency; Fallen said the effect is easier to detect with tones. In addition to tones, he transmitted "a 'dance track,' a Pachelbel Canon arrangement, and a variation of 'Row, Row, Row Your Boat.'" Jeff Dumps, KL4IU, composed some of the music, and he arranged and performed all of it.

The CW "airglow" artificial aurora experiment followed the Luxembourg effect transmissions. All week, Fallen despaired that the "ratty" ionosphere and cloud cover were diminishing his hopes for success with the artificial aurora experiments. But on the last night, he tweeted, "Seeing artificial airglow with the spectrometer. Film at 11."

Fallen is now evaluating the results of his HAARP efforts. Several listeners posted YouTube clips, including this one <<https://www.youtube.com/watch?v=8IR5VLCj69w&t=75s>> from Stephen Oleson, VE6SLP. Laurence Howell, KL7L, in Wasilla, Alaska, posted an audio file <<http://kl7l.com/haarp3.mp3>>.

Fallen posted additional information on his "Gakona HAARPo 2017" blog <<https://sites.google.com/alaska.edu/gakonahaarpoon/tune-in>>.

- Amateur Radio Emergency Service (ARES) volunteers actively supported communication for the evacuation and sheltering of nearly 200,000 people living below the damaged Oroville Dam in rural California last month, according to Sacramento Valley ARES Section Emergency Coordinator (EC) Greg Kruckewitt, KG6SJT. The dam, on the Feather River east of Oroville, is the tallest in the US. Following a period of heavy rain, a section of the earthfill-embankment dam's spillway eroded, and authorities ordered residents living below

the dam to evacuate, in case the dam should fail. Crews had been attempting to fill the eroded area with rock transported by helicopter. On February 14, authorities lifted the mandatory evacuation order, but said it could be re-imposed, if necessary. Residents returning home were advised to remain vigilant, should the situation again become critical, and some ARES activity continues.

Butte County ARES EC Dale Anderson, KK6EVX, was called out by the emergency operations center (EOC) on the evening of February 12. Six members of the Butte County ARES team had been deployed to the Red Cross evacuation shelter at the Chico fairgrounds. "ARC still wants us at the Chico Fairgrounds," Anderson told Kruckewitt on February 15. "We are down to one VHF unit and one operator on watch for now."

"Things have really calmed down for now after the mandatory evacuation notice was reduced to an evacuation warning," Kruckewitt told the American Radio Relay League on February 15. "At this time, only the Butte County ARES group is deployed to the Chico Fairgrounds to support the Red Cross — possibly through the weekend." The Chico shelter was going to remain open until the next storms pass.

FEMA reported that the Kelly Ridge Powerhouse located below Oroville Dam is flooded and unsafe. "Any further flooding could result in the potential release of 500 gallons of turbine oil stored in tanks," the agency said on February 15.

"All ARES groups in the section are on standby, if help is needed. So far, the dam is holding, and repair work is under way at last report," Kruckewitt said.

(Excerpts from the American Radio Relay League's <arrl.org> web site)



SBE RF101 Module 3: April 13, 1:00 - 2:15 CT

This module continues the RF101 Series and covers these topics: Transmission systems block diagram; common RF system components; antennas and terms; isotropic radiator; dipole and polarization; wavelength versus antenna size; variations on the dipole; and antenna gain introduction. This course is targeted to those with minimal or no background in RF and/or are relatively new to the field. This eight-part series serves as a refresher for more seasoned engineers.

The remaining five modules will be presented over the coming months. Watch for further announcements. The instructor is Dennis Baldridge, CPBE, 8-VSB, AMD, DRB, CBNT and a veteran of the broadcast engineering field for more than 30 years.

RF101: Broadcast Terrestrial Transmission Systems

Course Modules:

1. Introduction to Radio Frequency (RF) (January 26, 2017)
2. Transmission Lines (March 2, 2017)
- 3. Towers, Antennas, and Transmission Systems (April 13)**
4. Antenna Gain - Feed-line Loss (May 18)
5. Modulation Fundamentals (June 15)
6. AM, FM, TV RF Propagation (July 20)
7. RF Transmitter Measurements (August 24)
8. FCC Regulations (September 21)

Upon completion of the entire course, attendees will be able to: 1) Understand the basic characteristics of RF and electromagnetic radiation; 2) Describe different types of transmission lines, antennas, and their characteristics; 3) Understand the fundamentals of RF propagation; 4) Understand modulation and different modern modulation methods; 5) Describe various components used in RF communications systems; 6) Explain the basic characteristics of RF transceiver systems; 7) Define common terms used to characterize RF systems; 8) Understand how to perform a range of basic RF measurements; 9) FCC regulations pertinent to maintaining a broadcast facility.

The completion of this webinar from Webinars by SBE qualifies for 1 credit, identified under Category I of the Recertification Schedule for SBE Certifications.

Dennis Baldridge, CPBE, 8-VSB, AMD, DRB, CBNT, a veteran of the broadcast engineering field for more than 30 years. Baldridge is a Senior member of the SBE, holds an FCC Lifetime General License (formerly a First Class FCC License) and Amateur Radio Extra Class License (K0DB). He also holds a M.A.E. and teaches science courses for Upper Iowa University. As owner of Baldridge Communications, LLC, he works as a contract engineer and has also authored articles for Radio Guide. Baldridge serves as an inspector for the FCC Alternate Inspection Program of the Wisconsin Broadcasters Association.

Registration for each module will be done separately. Register here for Module 3.

SBE Members: \$57

Non-Members: \$87



CHAPTER 24 SUSTAINING MEMBERS

Recent Renewals:

Joseph Electronics

Ross Video

Thanks to all our Sustaining Members:

Alpha Video

AVI Systems

Belden, Inc.

Clark Wire and Cable

Full Compass Systems

Heartland Video Systems

Resonant Results, Ltd.

Sound Devices, LLC

Token Creek Productions

WISC-TV 3

WMTV-TV 15

WKOW-TV 27

WMSN-TV 47

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Society of Broadcast Engineers



The Association for Broadcast and
Multimedia Technology Professionals

FCC Takes Two Broadcast Actions

>>> by Tom Smith

The FCC took two actions as promised at their February 23 meeting. In one action, the Commission made changes to the FM translator rules to allow for more flexibility in siting their FM translators. The new rules (http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0228/FCC-17-14A1.pdf) will restrict the FM translator's 1 mV contour to be within an AM station's daytime contour or within 25 miles of the transmitter, whichever is greater. The old rules required the 1 mV contour of the FM translator to be within the daytime contour or 25 miles of the transmitter whichever was the lesser. This will allow AM stations to broadcast within the nulls of a directional antenna system. Over the years, many stations have run into the problem of population build up within the nulls of the antenna system which meant they were unable to serve that population area. The FCC made an announcement (http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0301/DA-17-202A1.pdf) on March 1 to AM stations that they would not accept new FM translator applications until the rules became official, which means until they are published in the Federal Register.

In the second action, the FCC issued a Notice of Proposed Rulemaking (http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0224/FCC-17-13A1.pdf) on adopting rules to allow TV broadcasters to convert to ATSC 3.0 operation. The FCC proposes the conversion to ATSC 3.0 be voluntary. Questions asked for comment include simulcasting of ATSC 1.0 signal while starting ATSC 3.0 operating, which will require channels sharing, cable carriage, interference and coverage issues, tuner mandates, single frequency networks, public interest obligations, interplay with ATSC 3.0 transitions, and notices to the public concerning a stations transition to ATSC 3.0. There will be a 60-day comment period with a 30-day reply period to follow. Comment period will start with publication in the Federal Register.

>>> **Auction** continued from page 1

for debt reduction. There is still one more step to be finished before the auction is completed. The wireless broadband companies bid for a 10 MHz unspecified block of spectrum in the forward auction. The FCC will now have the winners of the forward auction bid on which of the seven blocks of spectrum they want assigned to them in each of the markets that they won spectrum in. That auction starts on March 6 and will end on March 30. The final amount that the auction earns in the assignment phase will increase the final total earned in the auction. All TV stations received a confidential letter on February 9 on what new channel they were being moved to or if they were remaining on their current channel. Shortly after March 30 the FCC will issue a public notice announcing the new table of allotments. That is expected to be announced before the NAB convention starts on April 23, so broadcasters can talk to vendors that will supply transmitters, antennas, transmission lines and other equipment that they may need to transition to a new channel.

When the notice announcing the new table of allotments is issued, a three-

>>> **Auction** continued on page 7

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April 2017 Chapter 24 Newsletter Deadline:
Monday, April 3, midnight
pgstoffel@gmail.com

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Systems Sales Specialist
CTS, CSTE
tom.sibenaller@avisystems.com
d 608.807.1860 c 608.386.2611

SBE Chapter 24 Certification News

Congratulations, again, Elizabeth Delaquess of WMUU-LPFM, 102.9 FM, Madison, for successfully passing the SBE Certified Broadcast Technologist (CBT) exam in February 2017!

Thank you to the UW-Madison Memorial Union and the Educational Communications Board for allowing us to use rooms in your buildings for the February 2017 exams.

The Open 2017 Exam Schedule

Exam Dates	Location	Application Deadline (to SBE National Office)
April 25, 2017	NAB Show (Las Vegas)	March 17, 2017
June 2-12, 2017	Local Chapters (Madison Area)	April 21, 2017
August 4-14, 2017	Local Chapters (Madison Area)	June 5, 2017
November 3-13, 2017	Local Chapters (Madison Area)	September 25, 2017

From SBE.org: SBE Certification is not an FCC requirement. Nevertheless, it is evidence of an individual's qualifications to serve as an operator at a broadcast station and will certainly be useful when seeking employment or advancement. Each radio and television station has its own policies and procedures, and many have a written station manual. However, the FCC Rules and basic operator procedures apply to all stations. The *Certification Handbook for Radio Operators* and the *Television Operator's Certification Handbook* fill the needs of broadcast stations and operators today.

The SBE Radio and Television Operator Certifications are a great way to demonstrate to a prospective employer that you have acquired the basic knowledge to operate a radio or television station and comply with FCC Rules and Regulations. SBE member engineers are encouraged to help promising newcomers by giving advice and directions.

For questions about applying for an exam, please contact Jim Hermanson at services@jimhermanson.com or Megan Clappe at mclappe@sbe.org. Also, see the SBE National Web site at www.sbe.org.

When you are ready to take an SBE exam, please fill out the appropriate application and send it into the SBE National office (see address below). You will be notified once your application has been approved. Approximately 3 weeks before the exam time, your local certification chairman will receive a list of applicants in his/her area. He/she will then contact those applicants to schedule a date, time and place for the exams. The exams will be mailed back to the National office for grading. The pass/fail grades will then be mailed directly to the applicants.

You may mail, email or fax your applications to:

Megan E. Clappe
Certification Director
9102 N. Meridian St. Suite 150
Indianapolis, IN 46260
317-846-9120 Fax

Thanks to Leonard Charles
for maintaining the Chapter 24
web site and to Steve Paugh
for mailing the meeting
reminder postcards.



Mark Bartolotta

Notice of Elections

By Steve Paugh, Nominations Chair

In April we will hold elections for Chapter 24 offices of Chair, Vice-Chair, Secretary and Treasurer for the 2017-2018 term. Our current nominations for officers are:

Candidate for Chair-

Rich Wood

Candidate for Vice Chair-

Cliff Groth

Candidate for Treasurer-

open for nominations

Candidate for Secretary-

Mike Norton

Appointed Officers

The appointed offices do not fall under the jurisdiction of the nominations committee and are appointed by the Chair of Chapter 24. Traditionally, the existing appointed officers continue for another term automatically. If you are a current appointed officer and would like to step down, please contact the current Chair Kevin Ruppert. If you would like to serve as an appointed officer please make your desire known to the Chair.

The current appointed offices are Program Committee Chair—Steve Paugh and we have two vacancies on the Program Committee, Newsletter Editor—Paul Stoffel (*Paul is looking for someone to take over as Newsletter Editor*), Membership Chair—Paul Stoffel, Sustaining Membership—Fred Sperry, Certification and Education—Jim Hermanson, Frequency Coordination—Tom Smith and National Liaison—Leonard Charles.

Voting

All balloting will be done on-line using the link provided on the www.sbe24.org chapter web site. You will need your membership ID when you sign in to cast your ballot for authentication. The deadline for nominations and the submission of biographies will be March 31, 2017. The nominations committee consists of Steve Paugh (Chair), Mike Kulis and Leonard Charles.

>>> **Auction** continued from page 5

month period will start in which stations needing to change channels will have to file an application for a minor change and an estimate of costs. At the end of the three-month filing period, the 36-month construction period will start. For some stations, they will have to complete construction within two years, with the last stations completing the last phase three years after the construction period starts. The transition to new channels should be completed by the middle of summer of 2020 if the FCC schedule holds up.

A number of stations and groups have announced the amounts that they will receive for spectrum they gave up in the reverse auction. The groups only

announced the amount they are to receive, while the stations that announced their results also announced if they were going to go off the air, would share a channel or move to the VHF band. Here is the list so far. These groups received the following amounts: Fox \$350 million, Sinclair \$313 million, Univision \$376 million, Entervision \$264 million, Tribune \$190 Million, and Gray \$90.8 million. The following station announced their results: WRNN New York \$ 212 Million to go off the air; KRCB San Francisco \$72 million to go to VHF; WBIN Boston \$68.1 million to go off the air; WITF Harrisburg, PA \$25 million to channel share; WQED Pittsburgh \$9.9 million to go to VHF; WUST Tampa, \$18.7 Million to

Been to a Swap Fest Lately?

>>> by Steve Paugh

On Saturday April 8, 2017 the Madison Area Repeater Association will hold their annual Ham Radio swap fest in Stoughton, WI. Full details can be found at <www.qsl.net/mara>.

Vendors include commercial sellers and many private individuals who are cleaning out their closets of no longer needed items. You can find all manner of radio, computer, test equipment, tools, tubes and parts for sale. Doors open at 8AM and admission is \$5, parking is free! If you have items to sell, you can purchase an 8 foot sellers table for \$16. Hope to see you there!



go off the air; and WEMZ Flint, MI \$14 million to go off the air. The last four stations are PBS stations and in the case of the Tampa and Flint stations, there are other PBS stations serving the same area. Two stations announced their results, but not the amount they would receive. They are PBS station WUPV, Richmond, VA, which will be moving to VHF and commercial station WUAB in Cleveland which will be going dark. The total amount received from these groups and stations is \$2,143,500,000 or a little over 20% of the total taken in from the reverse auction. The information on the results from the groups and stations were from tvnewscheck.com and broadcastable.com. The auction totals are from FCC.gov.